in this assay because results are more reproducible due to the virtual genetic identity of the mice) is immunized with the immunogenic protein(s) in combination with a standard adjuvant, such as Freund's adjuvant, and a standard mouse immunization protocol (*see*, e.g., Harlow and Lane (1988) Antibodies, A Laboratory Manual, Cold Spring Harbor Publications, New York, for a standard description of antibody generation, immunoassay formats and conditions that can be used to determine specific immunoreactivity. Additional details on proteins, antibodies, antisera, etc. can be found in USSN 60/479,931, 60/463,869, and 60/496,548 entitled "Expanding the Eukaryotic Genetic Code;" WO 2002/085923, entitled "IN VIVO INCORPORATION OF UNNATURAL AMINO ACIDS;" patent application entitled "Glycoprotein synthesis" filed January 16, 2003, USSN 60/441,450; and patent application entitled "Protein Arrays," attorney docket number P1001US00 filed on December 22, 2002.

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60/135,821

USE OF O-tRNA AND O-RS AND O-tRNA/O-RS PAIRS

[0182] The compositions of the invention and compositions made by the methods of the invention optionally are in a cell. The O-tRNA/O-RS pairs or individual components of the invention can then be used in a host system's translation machinery, which results in a redox active amino acid being incorporated into a protein. The corresponding patent application "In vivo Incorporation of Unnatural Amino Acids", WO 2002/085923 by Schultz, et al. describes this process and is incorporated herein by reference. For example, when an O-tRNA/O-RS pair is introduced into a host, e.g., *Escherichia coli*, the pair leads to the in vivo incorporation of a redox active amino acid, which can be exogenously added to the growth medium, into a protein, e.g., myoglobin or a therapeutic protein, in response to a selector codon, e.g., an amber nonsense codon. Optionally, the compositions of the invention can be in an in vitro translation system, or in an in vivo system(s). Proteins with the redox active amino acid can be used as theraupetic proteins and can be used to alter catalytic function of enzymes and/or electron transfer pathways in proteins, to crosslink protein with small molecules and/or biomolecules, and to facilitate studies on protein structure, interactions with other protein, electron transfer processes in proteins and the like.

KITS

[0183] Kits are also a feature of the invention. For example, a kit for producing a protein that comprises at least one redox active amino acid in a cell is provided, where the